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(54) Title: **REF1 MODIFIED PLANTS AND PLANT SEEDS**

(57) Abstract: The present invention relates to plant cell wall synthesis, and to the synthesis of soluble compounds in plants commonly known as secondary metabolites or natural products. In particular, the present invention provides plant aldehyde dehydrogenases with a novel capacity of oxidizing hydroxycinnamaldehydes to hydroxycinnamic acids, and genes encoding the enzyme, as well as variants of the gene, and methods of using the genes and variants of the gene to modify plant chemistry. The methods of the present invention include reducing sinapine content of a seed, decreasing hydroxycinnamic acid content in a plant cell, and modifying lignin property in a plant cell wall by manipulating the activity of the novel plant aldehyde dehydrogenase in a plant cell.